well worthy of careful perusal, and in a short paragraph only the very salient points can be touched upon. The author begins with a plea for centralisation and a note of warning against the multiplication of universities, when ample means are not to hand for their equipment. Local convenience is undoubtedly an important consideration, as is also emulation between districts for the possession of intellectual centres, but both of these should be subordinate to the true interests of education. The equipment of the modern university is necessarily a very costly matter. The next point we can consider is the length of the medical curriculum. Prof. Wilson directs attention to the value of general education to the medical student, and views with regret the abolition by many universities of the obligatory preliminary degree in "Arts." In this connection he refers to the new regulations at Harvard, in which it has been enacted that the medical student shall undergo a preliminary four years' course in arts before entering upon his four years' medical curriculum. In view of the present controversy concerning elementary medical education, it is of interest to note that the author appears to accept the general educational value of special medical studies, but is apparently not in favour of the relegation of physics, chemistry and biology to the schools. The chief reason against this is the assumption that it would still add another year to the curriculum, and "this might be as well done frankly under university guidance." It may be objected, however, that the boy could perfectly well begin these studies at sixteen, and it is certainly a very open question whether at such an age he is better at the school or university. With regard to pharmacology, Prof. Wilson would relegate the experimental part entirely to the physiologist and the therapeutical part entirely to the physician. He apparently does not see in pharmacology as at present taught what he describes so accurately in the case of general pathology, namely, a "bridge-like" position in the medical curriculum, fitting the student, when essentially pursuing the intermediary subjects, for the problems awaiting him in the wards, and enabling him to utilise to the full the relatively small clinical experience which he will obtain. In conclusion, Prof. Wilson admits that the medical curriculum is at present full to overflowing, and recommends a somewhat novel plan to relieve it. He suggests, and instances certain American universities as precedents, a more universal use of the honours system. He would establish a system of "elective studies," would allow the student to specialise earlier in his career, and while demanding certain evidence of all-round knowledge, would very considerably reduce the standard in it, according to the depth and thoroughness of the work done by the student in certain directions. It must be admitted, however, that the magnitude of the irreducible minimum would be difficult to decide, as would also the thoroughness of "work done by the student in certain directions."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 23, 1901.—"On the Intimate Structure of Crystals. Part v.—Cubic Crystals with Octahedral Cleavage." By Prof. W. J. Sollas, F.R.S.

November 21, 1901.—"On Skin Currents, Part ii. Observations on Cats." By Augustus D. Waller, M.D., F.R.S.

In part i. it was stated that the normal electrical response of frog's skin to excitation is outgoing, from internal to external surface. In the skin of the pad of the cat's foot the electrical effect of excitation of the sciatic nerve proved to be ingoing, as stated by Luchsinger and Hermann. Dr. Waller determined this fact by decapitating cats and immediately testing the effect of excitation of the sciatic nerve on the pad of the foot; the effect gradually declines and disappears an hour after decapitation. It is pointed out that this experiment on a freshly killed animal is a convenient class demonstration of a fundamental fact which it has hitherto been thought necessary to demonstrate on living animals. The effect is elicited after the sciatic has ceased to provoke muscular contraction; the largest response observed and photographed was ·0100 volt, the lost time was three seconds.

In order to observe the response to direct excitation, the pad of a cat's foot was cut off and set up between unpolarisable electrodes; during the first forty-eight hours there is a normal ingoing current of ·0100 volt. If after exact compensation of this current a single induction current is sent in in either direction, the after-effect is nearly always outgoing, as in frog's skin; an ingoing effect is observed with a fresh skin and weak excitation.

Dr. Waller thinks it probable that both ingoing and outgoing forces may co-exist in the excited skin, the galvanometer expressing the resultant. In order to investigate the causes of the variability of the direction of response, the A B C method is devised:—Three electrodes are applied to the external surface of the skin, the third electrode C being used to examine separately the effects at A and B. By means of an especially designed switch called the M-shaped switch, an excitation can be applied at A and B, and the response led off through C and A, or C and B. The response is found to be always an outgoing current at A or B for both directions of excitation.

Physical Society, January 24.—Prof. S. P. Thompson, president, in the chair.—A paper on the factors of heat was read by Mr. James Swinburne. In all branches of physics, except heat, energy is divided into pairs of factors. Heat is generally thought of as a sort of indivisible energy and is not split into factors, but is treated as a whole, so that we have conductivity for heat, capacity for heat, specific heat, &c. Capacity for heat and specific heat are also taken when they include external work, at constant pressure for instance; so that the capacity is reckoned as capacity for energy which is only partly in the body or substance. So little is heat realised as energy that it has its own unit, so that equations involving other forms of energy with it need to be complicated with a coefficient. Temperature might be a factor of heat, but there is no corresponding quantity factor. There is no unit of temperature, it is measured in degrees which have no proper connection with anything. Temperature is sometimes treated as a tension factor with heat as the quantity factor, as when heat is said to run down temperature. Heat is thus regarded as its own quantity factor. Entropy is sometimes incorrectly used as the quantity factor corresponding to temperature. Entropy is at present indispensable as a function involving information as to whether heat has been or might have been converted into work. The author discusses "chy" as a possible factor for use with absolute temperature where "chy" is a quantity factor such that when multiplied by the temperature at which it is added or withdrawn gives the energy added or withdrawn. In the θ, χ system capacity, specific capacity and conductivity vary inversely as the temperature. These factors are not analogous with the factors of other forms of energy and are not convenient. The energy of heat is therefore split into $\tau\,\pi$, where τ is proportional to the square root of the temperature and is called by the author "tasis." The other factor, π, is called "posot." In any gas, tasis is proportional to the effective velocity and posot to the momentum. Tasis and posot are analogous to the tension and quantity factors already in successful use and indispensable in the treatment of other forms of energy. Conductivity of posot follows Ohm's law and the capacity of a body for posot is constant.

Chemical Society, January 16.—Prof. J. Emerson Reynolds, V.P.R.S., president, in the chair.—An investigation of the radio-active emanation produced by thorium compounds, by Prof. Rutherford and Mr. Soddy. The authors have previously shown that whilst thoria gives rise to a Becquerel radiation, it also communicates to gases passed over it a radio-active substance referred to subsequently as the emanation. They find that the emanating power of the oxide is destroyed by heating and can be restored by reprecipitation, and, further, that probably the emanating power is not a specific property of thoria, but is due to the presence of some foreign substance. As regards the nature of the emanation itself, it appears to be a gas of the argon type, since it is not destroyed by such powerful agents as red-hot lead chromate, white-hot platinum black, red-hot magnesium, &c.—The constitution of hydrocyanic, cyanic and cyanuric acids, by Dr. F. D. Chattaway and Mr. Wadmore. It is generally assumed by chemists at the present time that in these substances the hydrogen is joined to carbon and that they must be represented by such formulæ as H.C⋮N, HO.C⋮N, &c. The view that they are really the *iso*-compounds of the formulæ C:N.H, O:C:N.H, &c., is again brought forward by the authors, and the evidence afforded by the behaviour of the haloid cyanogen compounds—which is that of substances containing the haloid joined to nitrogen—is shown to necessitate their representation by such *imino*-formulæ.—A modification of Zeisel's method for the estimation of methoxyl groups, by Dr. J. T. Hewitt and Mr. T. S. Moore. The

complicated apparatus designed by Zeisel is greatly simplified by the substitution of a fractionating column consisting of nine aludels, alternately closed and open, arranged in series in a glass tube, for the sloping condenser with water at 40° C. and the washing bulbs containing amorphoric phosphorus. Results obtained with codeine and quinine proved that this rearrangement is effective in retaining iodine and hydriodic acid.—A new colour reaction of hydroxylamine, by Mr. W. C. Ball. When a solution of hydroxylamine or its salts is boiled with a solution of ammonium-sulphite until sulphur begins to form and to the liquid a strong solution of ammonia is added, together with a few c.c. of alcohol, a fine purple colour is produced which is visible when only one part of hydroxylamine in 500,000 of water is used.—On the sensitiveness of a thermoregulator, by Mr. A. W. C. Menzies. A description of an apparatus whereby a definite temperature may be maintained over considerable periods with a maximum variation of ·0025 of a degree.—Myricetin, Part ii., by Mr. A. G. Perkin. An account is given of the methyl and ethyl ethers of this colouring matter, extracted from the bark of the Indian tree *Myrica nagi*, and which has already been shown by the author to be a hydroxyquercetin. Myricetin appears not to occur free in the plant, but in the form of a rhamnose ether (glucoside), which has been named *myricetrin* ($C_{21}H_{22}O_{13}$).—The colouring matters of green ebony, by Messrs. A. G. Perkin and S. H. C. Briggs. This dyewood contains (*a*) *excoecarin*, $C_{13}H_{12}O_5$, easily oxidised by bromine to *excoecarone*, $C_{13}H_{10}O_5$, and hydrolysed by potash fusion to hydroquinone carboxylic acid. (*b*) Jacarandin, $C_{14}H_{10}O_3(OH)_2$, which appears from its reactions to belong to the quercetin series of dyes.—The action of methylene iodide on aryl- and naphthylamines; diaryl methylene diamines, acridines and naphthacridines, by Dr. Senier and Mr. Goodwin. With anilines, toluidines and xylidines, diamines are formed, but with amine of condensed substances such as naphthalene, bodies of the acridine type are produced.—The polymerisation of cyanic acid, by Dr. Senier and Mr. T. Walsh. In this reaction cyamelide is not, as is generally supposed, the only product, a quantity of cyanuric acid being also formed.

Mathematical Society, January 9.—Dr. Hobson, F.R.S., president, in the chair.—The president (Major MacMahon, F.R.S., vice-president, in the chair, *pro tem.*) communicated a paper on non-uniform convergence and the integration of series. Messrs. Larmor, Love, Whittaker and the chairman spoke on the subject of the paper, which followed out the work of Prof. Osgood.—Mr. S. Roberts, F.R.S., read a paper on networks. This paper treats of certain networks (1) with triangular meshes, (2) with polygonal meshes. They are intimately connected with the problem of colouring maps with four colours only. The doubts and difficulties which have arisen with regard to the demonstration of the general theorems involving the solution of the problem in question show the expediency of discussing limited and defined cases and passing to more general results step by step. The subject, the author says, is, in fact, larger and more intricate than the simplicity of the empirical solution would lead one to expect. The late Prof. Tait's theorem is animadverted upon and is considered to have been enunciated in too general a form. In connection herewith reference is made to Prof. Petersen's communication (*cf.* "L'Intermédiaire des Mathématiciens," vol. v., p. 226). But it is not certain that Prof. Tait was responsible for the unguarded statement (*cf. Phil. Mag.*, vol. xvii. pp. 30, &c.). In any case Prof. Petersen's example shows that the theorem is not absolutely general.—The president communicated a paper by Mr. W. H. Young, on the fundamental theorem of differential equations. The fundamental theorem of the modern theory is Cauchy's existence theorem, dealing with the existence and uniqueness of a set of integrals satisfying given initial conditions and the holomorphic character of the solution. Some doubt has been expressed as to whether the proofs furnished by Picard and Painlevé are rigorous. It has been suggested that it has not been conclusively demonstrated that the holomorphic solution is unique even in the simplest case which can arise. The paper gives a brief account of the theorem in question, and examines an example which has been put forward as typical of a large class of cases where the theorem fails.—A paper by Prof. W. Snow Burnside, on the integrals of the differential equation

$$\frac{du}{\sqrt{f(u)}}+\frac{dv}{\sqrt{f(v)}}=0, \text{ where } f(x)\equiv aax^4+4bx^3+6cx^2+4dx+e,$$

considered geometrically, was communicated by title.

Geological Society, January 8.—Mr. J. J. H. Teall, V.P.R.S., president, in the chair.—A system of glacier-lakes in the Cleveland Hills, by Mr. P. F. Kendall. After referring to existing "extra-morainic" lakes, such as the Märjelen See and those of the Chaix Hills, the author proceeds to deal with the criteria for the recognition of such lakes. These include beaches, deltas, floor-deposits and overflow-channels. Shore-scarps are common in Cleveland, but beaches are rare or absent, the reason being in part that stability was rarely secured owing to the overflows being over soft Jurassic strata. Deltas also are not common. The floor-deposit of lakes may be distinguished from river-alluvia by the fact that the lamination is close and regular, but, being parallel to the subjacent surface, it may be highly inclined. On the other hand, alluvia are laid down on horizontal surfaces, but rarely show good lamination. Evidence from borings and drift-filled channels is given to show that during or before the Glacial period the land was considerably above its present level. The Glacial deposits are described in detail from sections and borings, some of them carried out by the author, and the assemblages of boulders are identified and classified into three chief groups—a western group, from the Solway, Vale of Eden, Stainmoor Pass and the Tees; a northern group, from the Tweed and Cheviots and from eastern Durham; and an eastern group, from the Christiania region, the Gulf of Bothnia and Denmark or the North Sea. The author has been unable to detect any signs of the presence of the sea in this area at any time during the Glacial period. Three main ice-masses appear to have been concerned in producing the deposits—one from the southern Uplands and the Solway, joined by the local ice of the Tees; a second originating in the Tweed Valley, and driven southward round the Chevoits by the pressure of the third, or Scandinavian, ice-mass. The general order of events is supposed to have been: (1) the unobstructed passage of the Teesdale glacier to the coast, (2) the arrival of the Scandinavian ice, and (3) the invasion of the Scottish ice. The first of the extra-morainic lakes described is that of the Vale of Pickering, the lowest of the sequence, which for a long period received all the drainage of the district except that of the western margin, and the outflow from which into Lake Humber was that now occupied by the River Derwent. Newton Dale was the outflow of the lake-series of the Eskdale country. The Eskdale system comprises a series of lakes connected by an "aligned sequence" of overflows; and here it is possible to trace the consequences of the shrinkage of the ice-masses and to follow out the low-level phases of the lake. The ice pressing upon the northern face of the Cleveland Hills gave rise to a series of lakelets, connected with which are the following set of overflows:—Scugdale and Scarth Nick, Bilsdale, Kildale, Ewe Crag Beck, Tranmire, and Egton Moor. Iburndale contained a lakelet overflowing eastward. Behind a narrow coast-strip of country, extending from Robin Hood's Bay to Hunmanby, there runs a gorge which receives all the drainage of the "hinterland" and carries it into the Vale of Pickering. In the production of this arrangement the effects of an ice-sheet shutting the seaward ends of the valleys are traceable; the position of the main overflows was stable, and the drainage was permanently deflected.—The glaciation of Teesdale, Weardale and the Tyne Valley, and their tributary valleys, by A. R. Dwerryhouse. After an account of the topographical solid geology of Teesdale, the author describes four distinct types of drift in the area. A detailed description of the Glacial deposits, boulders and striæ is given, and from this the following conclusions are deduced:—Upper Teesdale was heavily glaciated by local ice from the eastern slope of the Cross Fell Range; this part of the Dale was not invaded by any other ice, and the higher peaks stood out as nunataks. At the period of maximum glaciation a number of lakes were formed, owing to the obstruction of the drainage of lateral tributary-valleys by the ice of the main glaciers. Lunedale was occupied by ice (the Stainmoor glacier) which came from the drainage-basin of the Irish Sea, joined the Teesdale glacier about Middleton-in-Teesdale, and by its thrust deflected the Teesdale ice into the valley of the Wear. During the retreat of the ice there was a lengthened period of "constant level," when well-marked drainage-channels were formed, and after this the ice was removed with great rapidity. A tongue of ice flowed from Upper Teesdale by Yad Moss to the Valley of the South Tyne.

Zoological Society, January 14.—Prof. G. B. Howes, F.R.S., vice-president, in the chair.—Dr. A. S. Woodward, F.R.S., exhibited a newly-discovered upper molar tooth of Onohippidium from the cavern near Consuelo Cove, in Last

Hope Inlet, Patagonia. This new specimen was fixed in the bone and bore trace of the soft parts.—Mr. Oldfield Thomas, F.R.S., exhibited and made remarks upon the skin of a female yellow-backed duiker (*Cephalophus sylvicultrix*) which had been obtained in the Awemba district of north-eastern Rhodesia, and presented to the British Museum by Mr. Robert Codrington. This species had previously been known only from West Africa. —Mr. Tegetmeier exhibited the skin of an animal which it had been suggested was a hybrid between a hare and a rabbit, but which proved to be merely a variety of a hare.—Prof. E. B. Poulton, F.R.S., read a paper (illustrated with lantern-slides) by Mr. R. Shelford, curator of the Sarawak Museum, on cases of mimicry amongst Bornean insects and spiders. The author, who had carefully studied this subject in the Malay Archipelago, had made some striking discoveries, and among them were: (1) the well-marked mimetic resemblance of the Mantispidæ to the Hymenoptera; (2) the wonderfully large and complex group of insects of all kinds which mimicked the common dammar bee (*Trigona apicalis*); (3) the large amount of mimicry in longicorn beetles, some resembling Hymenoptera, others Phytophaga, others Lycidæ and others Rhynchophora; (4) the fact that longicorns of the genus Chloridolum and also of some genera of Clytinæ were mimicked by other longicorns; and (5) the re-discovery of the locustid *Condylodera tricondyloides*, formerly described by Westwood from Java, being a splendid mimic of the cicindelid Tricondyla.—A communication was read from Mr. F. H. A. Marshall, describing the variation in the number and arrangement of the male genital apertures in the Norway lobster (*Nephrops norvegicus*), as observed on an examination of a series of 1080 specimens of this crustacean.—A paper was read by Dr. Einar Lönnberg chiefly dealing with the alimentary canal of Trichosurus, Pseudochirus, Phalanger and Petaurus. The varying length of the different sections of the gut and their structure were correlated with the varied food of these marsupials.—A communication from Dr. L. von Lorenz gave an account of the mounted specimen of the quagga (*Equus quagga*) in the Imperial Museum of Natural History at Vienna, and pointed out its differences from other known specimens of this animal.—Mr. J. Lewis Bonhote contributed a paper on a small collection of mammals made by Mr. Th. H. Lyle in Siam. Of the eight species enumerated in the paper, a hare was described as new under the name of *Lepus siamensis*.—A communication from Dr. A. G. Butler contained an account of two collections of Lepidoptera made by Sir H. H. Johnston, K.C.B., in the Uganda Protectorate during the year 1900. The species, of which specimens were contained in the collection, were enumerated, and three of them, viz. *Harma johnstoni*, *Pseudathyma plutonica* and *Aphnaeus hollandi*, were described as new.—Mr. W. L. Distant communicated a paper on the insects of the order Rhynchota collected by Sir H. H. Johnston, K.C.B., in the Uganda Protectorate, in which it was pointed out that the species, of which specimens were contained in the collection, showed marked affinities with the West African forms of these insects.

Entomological Society, January 15.—The sixty-ninth annual meeting, the Rev. Canon Fowler, president, in the chair. —It was announced that the following had been elected officers and council for the session 1902–1903:—President, the Rev. Canon Fowler; treasurer, Mr. Robert McLachlan, F.R.S.; secretaries, Mr. Herbert Goss and Mr. Henry Rowland-Brown; librarian, Mr. George C. Champion; and as other members of council, Mr. R. Adkin, Prof. T. H. Beare, Mr. Arthur J. Chitty, Mr. W. L. Distant, Dr. F. D. Godman, F.R.S., the Rev. Francis D. Morice, Prof. E. B. Poulton, F.R.S., Mr. Edward Saunders, Dr. David Sharp, F.R.S., and Colonel Swinhoe. The president announced that he should appoint Dr. F. DuCane Godman, F.R.S., Prof. E. B. Poulton, F.R.S., and Dr. D. Sharp, F.R.S., as vice-presidents for the session 1902–1903. He then delivered an address in which he dealt chiefly with the question of protective resemblance and mimicry in the case of the Coleoptera, a branch of the subject concerning which but little has been recorded, although mimicry in this order is quite as important as in the case of the Lepidoptera; as a matter of fact, beetles are protected in many ways: by a hard integument, by the assimilation of colour or form to environment, by adopting colours in strong contrast to environment (warning colours), by protective attitudes, by warning attitudes, by warning sounds, by the secretion of distasteful juices or odorous substances, by resemblance to unpleasant substances such as the droppings of birds, by resemblance to well-protected insects other than Coleoptera such as ants, bees and wasps, by imitating other genera and species of the same order which are plainly distasteful. In the course of the address it was pointed out how easily it can be proved that beetles form a large part of the food of birds, as their hard elytra or wing-cases remain for some time entire in their stomachs; in this way it can be proved which species are most liked, and which are disliked or rejected. It is an interesting fact that many of the rapacious birds devour large numbers of beetles, and that a systematic examination of the stomachs of birds proves that the damage done to game is much less than is usually believed, for many of the most persecuted species are mainly or to a very great extent insectivorous; it would be well, therefore, on all grounds, that the indiscriminate slaughter of our few remaining birds of prey should be rigorously discountenanced.

PARIS.

Academy of Sciences, January 20.—M. Bouquet de la Grye in the chair.—On the use of lunar distances at sea, by M. E. Guyou. The method for the determination of the longitude by lunar distances has fallen into disrepute during the last century, and the Bureau des Longitudes has decided that the amount of work required each year for the prediction of lunar distances is out of all proportion to the benefit derived from them by mariners; in the next volume of the *Connaissance des temps*, for 1905, these calculations will accordingly be discontinued. In the present paper a simplified formula is worked out for the case of those navigators who still wish to use this method.—On some properties of fused lime, by M. Henri Moissan. Quicklime, if pure and free from silicate, is melted only in small quantity and with great difficulty at the highest temperature obtainable with the oxy-hydrogen blowpipe; it is, however, melted with great ease in the electric furnace, and with an arc of 1000 amperes first melts and then boils. On cooling, the crystals were found to belong to the cubical system, although after keeping for some months the crystals broke up into others which acted upon polarised light. The density of the lime was raised from 3·3 to 3·4 by fusion. Since lime forms the basis of the electric furnace, it was of importance to study the effect of heating it to high temperatures with various substances. The results of the reactions with carbon, silicon, boron, titanium, chromium, manganese, iron, nickel, cobalt and platinum are given.—The analysis of some antique metallic objects, by M. Berthelot.—On the passage from hermaphrodism to the separation of the sexes by unilateral parasitic castration, by M. Alfred Giard. It appears probable that there exists in the Compositæ parasitic fungi of several kinds. The morphogenic action of these upon their host varies, and the influence of these parasites upon the condition of sexuality of their hosts is equally variable, and furnishes natural experiments of great interest for general biology.—On the conditions to the limits in hydrodynamics, by M. P. Duhem.—On the growth of entire functions, by M. Pierre Boutroux.—Remarks on the preceding communication, by M. Paul Painlevé.—On factorial series, by M. Niels Nielsen.—Coincidences between the elements of the planets, by M. Jean Mascart.—On the application of the Lagrangian equations to electrodynamic and electromagnetic phenomena, by M. Lièнard. M. Carvallo, starting with the example of Barlow's wheel, comes to the conclusion that the equations of Lagrange are not always applicable to electrodynamic phenomena, especially in the case of conductors of two or three dimensions. In the present paper it is shown that this restriction is unnecessary and that a rigorous application of the Lagrangian equations gives perfectly exact results in the case of the motion of Barlow's wheel.—Electrodynamics of bodies in motion, by M. E. Carvallo.—Critical constants and molecular complexity of some organic compounds, by MM. Ph. A. Guye and Ed. Mallet. The conclusion is drawn that all the aliphatic nitriles are clearly polymerised, their coefficients of polymerisation being larger than have been hitherto observed.—On some physical properties of hydrogen selenide, by MM. de Forcrand and Fonzes-Diacon. The gas was obtained in a pure state by the action of a little water upon pure aluminium selenide over mercury. Its boiling point under ordiaary pressure was found to be −42° C., its melting point −64° C., and its density in the liquid state 2·12 at −42° C. Its solubility in water was found to be less than has usually been supposed.—Remarks on the oxides of molybdenum, by M. Marcel Guichard.—On the decomposition of acetylene during its combustion, by M. Fernand Gaud. An experimental study into the causes of the shoking

up of acetylene burners.—On the tribromo- and triiodo dinaphthoxanthonium and on the hydrobromic, dibromo-, and hydriodic diiodo-ethers of the supposed binaphthylene glycol, by M. R. Fosse.—On the action of the mono-halogen propionic esters upon the sodium derivative of acetyl-acetone, by M. Fr. March.—Contributions to the study of the chemical modifications in plants submitted to the influence of sodium chloride, by MM. E. Charabot and A. Hébert. The addition of common salt to the soil has the following effects: it increases the percentage of organic matter in the plant, and also increases the relative loss of water. At the same time that this double influence is exerted on the plant, the sodium chloride favours esterification and reduces the transformation of menthol into menthane.—The biological theory of vision, by M. Georges Bohn. A criticism of the theory of vision put forward by M. Pizon. Of the three essential ideas of this theory, M. Bohn regards the first as not new and the two latter as not true.—The elementary forms of phosphorus in the invertebrates, by M. Jean Gautrelet. In the blood, carapace and shells of crustacea and molluscs, phosphorus exists in two elementary forms, mineral and organic.—The utilisation of sugars by the organism, by MM. Charrin and Brocard.—On the assimilation of sugar and of alcohol by *Eurotyopsis Gayoni*, by M. P. Mazé. The analytical results quoted would tend to show that the mycelium of this fungus is capable of utilising both alcohol and ammonia without loss of material.—The indications of the prophylaxy and treatment of pulmonary tuberculosis, by MM. Albert Robin and Maurice Binet.—On the origin of certain diseases of chrysanthemums, by M. Chifflot. Two diseases of the chrysanthemum described by M. Joffrin as new have been well known for some time both to botanists and horticulturists.—The siliceous tufa of Côte-aux-Buis, at Grignon, by M. Stanislas Meunier.—On the appearance of lesions in a foal analogous to those produced in its mother by an accident, by M. Le Hello.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 30.

ROYAL SOCIETY, at 4.30.—The Chemical Origins of the Lines in Nova Persei: Sir Norman Lockyer, K.C.B., F.R.S.—The Specific Volumes of Oxygen and Nitrogen Vapour at the Boiling Point of Oxygen: Prof. J. Dewar, F.R.S.—The Distribution of Magnetism as affected by Induced Currents in an Iron Cylinder when rotated in a Magnetic Field: Prof. E. Wilson.

ROYAL INSTITUTION, at 3.—Recent Excavations at Delphi and in the Greek Islands: Dr. A. S. Murray.

FRIDAY, JANUARY 31.

ROYAL INSTITUTION, at 9.—The Ions of Electrolysis: Prof. A. Crum Brown, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Quay-Walls of Keysham Harbour: J. C. Collett and W. H. C. Clay.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Discussion of the Paper by Mr. H. F. L. Orcutt, on Modern Workshop Methods.

MONDAY, FEBRUARY 3.

SOCIETY OF ARTS, at 8.—The Purification and Sterilisation of Water: Dr. Samuel Rideal.

IMPERIAL INSTITUTE, at 8.30.—The Native Races of Nigeria: Dr. C. F. Harford-Battersby.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Explosion of Potassium Chlorate by Heat: Dr. A. Dupré, F.R.S.—The New Table Photometer and Standard Pentane Burner prescribed by the Gas Referees for use in the London Gas-testing Stations: Dr. F. Clowes.

TUESDAY, FEBRUARY 4.

ROYAL INSTITUTION, at 3.—The Cell: its Means of Offence and Defence: Dr. A. Macfadyen.

SOCIETY OF ARTS, at 4.30.—The History of the Rosary in all Countries: Rev. Herbert Thurstan, S.J.

ZOOLOGICAL SOCIETY, at 8.30.—Ecdysis, as Morphological Evidence of the Original Tetradactyle Feathering of the Bird's Fore-limb: Edward Degen.—A Revision of the Amblypodia-Group of the Lycænidæ: G. T. Bethune-Baker.—Notes on the Osteology of *Cogia breviceps*: Prof. W. Blaxland Benham.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Papers to be further discussed*: The Sewerage Systems of Sydney, N.S.W., and its Suburbs: J. Davis.—The Bacterial Treatment of Trades Waste: W. Naylor.

MINERALOGICAL SOCIETY, at 8.—On the Hornsilvers: G. T. Prior and L. J. Spencer.—The Identity of Kilbrickenite with Geocronite: Analyses of Miersite, Marshite and Copper-Pyrites: G. T. Prior.—A New Sapphirine-like Mineral from Ceylon: G. T. Prior and A. K. Coomara-Swamy.—Attempts to reproduce Interference-Effects by Three-Colour-Printing: Prof. Miers.

WEDNESDAY, FEBRUARY 5.

SOCIETY OF ARTS, at 8.—Jamaica: Herbert T. Thomas.

GEOLOGICAL SOCIETY, at 8.—On the Matrix of the Suffolk Chalky Boulder-Clay: Rev. Edwin Hill.—On the Relation of certain Breccias to the Physical Geography of their Age: Prof. T. G. Bonney, F.R.S.—On some Gaps in the Lias: E. A. Walford.

ENTOMOLOGICAL SOCIETY, at 8.

SOCIETY OF PUBLIC ANALYSTS, at 8.

THURSDAY, FEBRUARY 6.

ROYAL SOCIETY, at 4.30.

SOCIETY OF ARTS, at 4.30.—The Coal Resources of India: Prof. W. R. Dunstan, F.R.S.

LINNEAN SOCIETY, at 8.—On a Method of Investigating the Gravitational Sensitiveness of the Root-tip: F. Darwin, F.R.S.—An Extinct Family of Ferns: Dr. D. H. Scott, F.R.S.

CHEMICAL SOCIETY, at 8.—An Investigation into the Composition of Brittle Platinum: W. N. Hartley.—Conversion of *l*-Hydroxycamphene into β-Halogen Derivatives of Camphor: M. O. Forster.—Tetrazoline, Part II.: S. Ruhemann and H. E. Stapleton.—(1) The Solubilities of the Calcium Salts of the Acids of the Acetic Acid Series; (2) The Equilibrium between a Solid and its Saturated Solution at various Temperatures: J. S. Lumsden.—The Influence of Temperature on Association in Benzene Solution, and the Value of the Molecular Rise of Boiling Point for Benzene at Different Temperatures: W. R. Innes.—The Magnetic Rotation of Ring Compounds; Camphor, Limonene, Carvene, Pinene, and some of their Derivatives: W. H. Perkin, sen., F.R.S.—Polymerisation Products from Diazoacetic Ester: O. Silberrad.

RÖNTGEN SOCIETY, at 8.30.—A System of Radiography: E. W. H. Shenton.

FRIDAY, FEBRUARY 7.

ROYAL INSTITUTION, at 9.—The New Mammal from Central Africa and other Giraffe-like Animals: Prof. E. Ray Lankester, F.R.S.

GEOLOGISTS' ASSOCIATION, at 7.30.—Annual General Meeting.—Address on a Dozen Years of London Geology (Eocene, Chalk, and Underground): W. Whitaker, F.R.S., President.

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